Space Administration

Lyndon B. Johnson Space Center Houston, Texas



Look back

Photographs tell the story of 1990 and the dawn of the decade at JSC. Photos on Page 3.



Look up

JSC employees get an unusually close-up look at Columbia and its Shuttle Carrier Aircraft. Photo on Page 4.

Space News Roundup

Ethics reforms affect federal employees' lives

By Kari Fluegel

Ethics reforms that have swept through Congress now are making an appearance in the lives of all federal

As an example, on Jan. 1 the Ethics Reform Act of 1989 instated prohibitions on government employees from receiving compensation in the form of money or anything of value for making appearances or speeches or for writing articles on any subject, said Hank Flagg, JSC chief counsel.

The regulations are not limited to broad and that it is a difficult document Receiving honoraria for writing or speaking about outside interests or hobbies is prohibited.

As examples, an engineer cannot accept an honorarium for giving a presentation about fishing nor can a procurement officer accept compensation for writing an article about training dogs.

Flagg said the scope of the new ethics reform statute is extremely

work-related topics, Flagg said. to interpret. The original act was 68 pages long and has had 14 pages of amendments since it was passed

Flagg said the honorarium reform is directed primarily at one-time events or appearances. Accepting a salary or other compensation from an employer, such as individuals with outside teaching assignments, is not prohibited, and the authorship of books is not affected.

Employees can request, however, rule could result in a fine up to \$10,000 that any honoraria—not to exceed \$2,000—be donated to a charitable organization if neither that individual nor specified family members derive any benefit from the organization. These donations do not carry any tax burden for the speaker or writer, but also cannot be used as a deduction on income taxes. Previously, the speaker or writer would carry the donation as a liability on his or her taxes.

The penalty for violating the ethics

or the amount of the honorarium, whichever is greater, Flagg said.

According to the Office of Government Ethics, efforts to narrow the honoraria prohibition will be a subject of debate in Congress this year.

The Ethics Reform Act of 1989 also makes some amendments to postemployment restrictions and provides a tax rollover for divestment of financial interests required to avoid a

Please see ETHICS, Page 4

Shuttle work resumes after holiday break

By James Hartsfield

Following a holiday break to allow maintenance work on Kennedy Space Center's processing and launch facilities, power was turned on aboard Discovery and Atlantis this week and preparations for upcoming missions resumed.

Electricity was turned on to Discovery on Wednesday afternoon in Bay 1 of the Orbiter Processing Facility. Immediately afterward, the spacecraft's payload bay doors were opened. Work planned for the week included a high-pressure helium test of the main propulsion system and installation of the forward reaction control system.

In high bay 1 of the Vehicle Assembly Bldg., the external tank and solid rocket boosters that will be attached to Discovery for STS-39 are mated. Close outs of the SRBs and tank stacking are under way.

Preparations for STS-39 are ahead of schedule and may allow a launch in late February rather than in early March if they continue to go smoothly.

Atlantis, in OPF Bay 2, is to be powered up today. The payload bay doors will be opened afterward and the remote manipulator system, or robot arm, will be installed. The arm will be used to deploy the Gamma Ray Observatory on STS-37 in early

April. With power off this week, the five general purpose computers on Atlantis were replaced with advanced models, half as large but with more than twice the memory and three times the computing speed of the original models. The first flight of the new on-board computers will be aboard Discovery on STS-39.



STS-39 crew members, wearing their partial pressure launch and entry suits, line up for their official portrait. The double exposure utilized an actual Earth-limb photograph and man-made ground "fog." From left are Mission Specialists Lacy Veach, Don McMonagle, Greg Harbaugh, Commander Mike Coats, Pilot Blaine Hammond and Mission Specialists Richard Hieb and Guy Bluford.

Space station design review ends on time

The year-long Integrated System Preliminary Design Review for Space Station Freedom, a major milestone on the road to its construction, launch and assembly, was completed on schedule last week.

Every major component, subsystem and system was examined over the course of the past 13 months. More than 80 separate design reviews were conducted at JSC. other NASA centers and contractor facilities to ensure Freedom's preliminary design could satisfy requirements for safety, physical and functional compatibility, construction, integration with other hardware and testing.

"We did it," said Marc Bensimon, deputy manager for Freedom's Program and Operations Office in Reston, Va., who headed the ISPDR effort. "We established the schedule for the PDR last April and we met every milestone as

"This was an outstanding effort," said Robert Moorehead, deputy director for Space Station Freedom Program and Operations. "Not only did we accomplish the PDR on schedule, we made the schedule despite having to devote a lot of time and attention to other issues, like weight and power and EVA (extravehicular activity) resources.

Preliminary figures for Freedom's weight as of June 1990

Please see **SPACE**, Page 4

JSC to host Total Quality Management colloquium

Total Quality Management Colloquium on Tuesday, featuring the head of the Houston-based American Productivity and Quality Center.

Dr. C. Jackson Grayson, chairman and chief executive officer of the center, will discuss TQM as the national imperative and focus of organizational change.

Please see WORK, Page 4 agency. JSC's Television Distribu- petition from abroad had become and First City Bancorporation in quality and productivity by 1995.

JSC will host its first agencywide tion System will carry the discussion increasingly challenging. He formed Houston, and the author of three live on Channel 4 and a special viewing room will be provided in Bldg. 16, Rm. 259.

Grayson founded the American Productivity and Quality Center after serving as the chairman of the United States Price Commission, which administered price-wage controls in the early 1970s. During his work with The colloquium, which will be from controls, Grayson said he became noon-1:30 p.m. in the Bldg. 30 aware of how important productivity auditorium, is the latest in a series is to the well being of the country, of TQM seminars presented by how American productivity growth Potlatch Corp., Tyler Corp., Harris strategy that will have as its goal a Also, auxiliary power unit 2, one NASA Headquarters for the entire had begun to slow and how com- Corp., Dallas Corp., Browning-Ferris tenfold increase in the center's

the non-profit center to alert the nation and work on the problems.

Grayson, a certified public accountant and graduate of Tulane University, Wharton School of Business and the Harvard Business School, has held professorships at Harvard, Stanford, Tulane and SMU and has been dean of the business schools at Tulane and SMU.

books, the latest with Carla O'Dell, entitled "American Business: A Two-Minute Warning."

TQM is a set of principles, processes and techniques designed to involve all employees from the top down in a concerted effort to improve the quality of an organization's products, services and processes.

A TQM steering committee estab-He also is a member of the board lished by JSC Director Aaron Cohen of directors of Sun Co., IC Industries, is formulating an implementation

Silver Snoopy wags tail for outstanding workers

employees have received their coveted Silver Snoopy Awards in recent weeks

The awards, presented by astronauts to less than 1 percent of the total NASA and contractor work force each year, signifies outstanding contributions to NASA's flight safety and mission success.

Receiving silver Snoopy lapel pins and certificates of appreciation were: Joseph Rogers, Information Technology Division; Ann Sullivan, Space Shuttle Procurement Division; Pete Strahl, Management Services Division; Carol Smith, Security Division; Fred Burns, Flight Support Equipment Office; Jim McBarron II, Crew and Thermal Systems Division, Lt. Col. Rusty Roe, Customer Integration

Twenty-three JSC civil service Office; Tom Allen, Reconfiguration Management Division; and Louis Hackney, Space Shuttle Ground Systems Division.

Other award winners included: Troy Heindel and Richard Fullerton, Systems Division; Lis Menning, Training Division; Brian Perry and Jeff Bertsch, Flight Design and Dynamics Division; Gail Schneider, Operations Division; Claudette Gage, Medical Sciences Division; Vickie Kloeris, Man-Systems Division; Beverly Cox, Facility Development Division; Jim Kelley, Tracking and Communications Division; Kirk Shireman, Navigation Control and Aeronautics Division; Elizabeth Bains and Larry Walter, Automation and Robotics Division; and Al Alcantar, Orbiter Projects Resident Office, Downey, Calif.



AN ALIEN'S VIEW-This near-infrared photograph of Earth taken by the Galileo spacecraft shows what extraterrestrials approaching Earth might see. It was taken Dec. 11 at a distance of 1.32 million miles as Galileo flew by Earth for a gravity assist.

No smoking policy goes into effect

It's official. JSC now has a smoke-free interior environment.

The no-smoking policy inside JSC buildings and government vehicles went into effect quietly over the New Year's Day holiday.

JSC Director Aaron Cohen put aside his pipe and cleaned out his ashtrays on Monday, a day before the Jan. 1 no-smoking deadline arrived.

We don't expect any problems with implementing this change," said Harvey Hartman, acting director of Human Resources. "It's a little bit like any other work rule. Generally our people treat those like adults and are responsive to them and we think they'll see this one in the same way."

Openings are available in the second JSC Smoking Cessation Class that begins Jan. 10 for JSC civil servants, contractors and their spouses who want to quit. The eight-week class will be offered by the Human Resources Office from 11 a.m.-noon every Thursday through Feb. 28 in the Gilruth Center, Rm. 206.

Please see SMOKER'S Page 4

Ticket Window

The following discount tickets are available for purchase in the Bldg. Today 11 Exchange Gift Store from 10 a.m.-2 p.m. weekdays.

General Cinema (valid for one year): \$4 each.

AMC Theater (valid until May 1991): \$3.55.

FBA Memberships and coupon books are now available-\$1 off civil service employees' first book: Gold C-\$5; Express Savings-\$15; Entertainment 91-\$25.

Thermographed: Raised lettering and logo business cards can be ordered by civil service employees in Bldg. 11 - 250 cards per set: old logos-\$21; new logos-\$18.

Gilruth Center News

Sign up policy-All classes and athletic activities are first come, first served. Sign up in person at the Gilruth Center and show a badge or EAA membership card. Classes tend to fill up four weeks in advance.

EAA badges-Dependents and spouses may apply for a photo I.D. 6:30-9 p.m. Monday-Friday.

Defensive driving-Course is offered from 8 a.m.-5 p.m., Jan. 26. or Feb. 16. Cost is \$15.

Aerobics and exercise—Both classes are on-going.

Country and western-Six-week class begins Jan. 7 and meets Mondays; openings available only in intermediate class. Cost is \$20 per couple.

New way to start your day!



The JSC Employee Information Service now is updating its reports at 8:30 every morning.

For the latest information on what's happening at JSC, from seminars to crew return ceremonies, the JSC Employee Information Service has what you're looking for.

The recorded announcement can be reached by calling: 483-6765

Dates & Data

Cafeteria menu—Special: tuna and noodle casserole. Entrees: broiled codfish, fried shrimp, baked ham. Soup: seafood gumbo. Vegetables: corn, turnip greens, stewed tomatoes.

Monday

NMA membership drive---The JSC Chapter of the National Management Association will show the video 'This is NMA" during its 1991 membership drive. The video will be shown at noon and 2 p.m. Jan 7-18 on closed circuit television. For more information contact Linda Massey at x36656, or Nancy Byrd at x34011.

Cafeteria menu-Special: meatballs and spaghetti. Entrees: weiners and beans, round steak with hash browns. Soup: chicken noodle. Vegetables: okra and tomatoes, carrots, whipped potatoes.

Tuesday

TQM discussion—A Total Quality Management Colloquium is scheduled for noon-1:30 p.m. Jan. 8 in the Bldg. 3 auditorium. Dr. C. Jackson Grayson will discuss TQM as the national imperative and as the focus of organizational change. The colloquium will be carried on closed-circuit television in Bldg. 16, Rm. 259 and the JSC Television Distribution System Channel 4.

Cafeteria menu-Special: fried chicken. Entrees: beef stew, shrimp creole, sweet and sour pork chop with fried rice. Soup: beef and barley. Vegetables: stewed tomatoes, mixed vegetables, broccoli.

Wednesday

Book signing—Former Mercury

astronaut Scott Carpenter will sign copies of his new novel, "The Steel Albatross" from 4-5:30 p.m. Jan. 9 at Jeremy's Bookshelf, 2441 Bay Area Blvd. For more information, call 486-

AFCEA meeting-The Armed Forces Communication and Electronics Association will meet at 11:30 a.m. Jan. 9 at the Nassau Bay Holiday Inn. The speaker will be Major Gen. Thomas Eggers, commander of Air Force Special Operations Command at Hulbert Field. For more information contact Veronica Mullins at 283-7342.

Cafeteria menu-Special: Swiss steak. Entrees: fried perch, New England dinner. Soup: seafood gumbo. Vegetables: Italian green beans, cabbage, carrots.

Thursday

Cafeteria menu-Special: stuffed bell pepper. Entrees: turkey and dressing, enchiladas with chili, wieners and baked beans. Soup: cream of chicken. Vegetables: zucchini squash, English peas, rice.

Friday

Cafeteria menu-Special: Salisbury steak. Entrees: baked scrod, broiled chicken with peach half. Soup: seafood gumbo. Vegetables: cauliflower au gratin, mixed vegetables, buttered cabbage, whipped potatoes.

Jan. 22

BAPCO meets—The Bay Area PC Organization will meet at 7:30 p.m. Jan. 22 at the League City Bank and Trust. Call Earl Rubenstein, x34807, or Tom Kelly, 996-5019, for more information.

Jan. 24

AIAA meeting-The American Institute of Aeronautics and Astronautics will meet at 5:30 p.m. Jan. 24 at the Gilruth Center. Konrad K. Dannenberg, winner of the 1990 AIAA National Durand award, will speak. Members and spouses \$8; non-members \$9; and students/young members \$7. Dinner reservations deadline is noon Jan. 18. For more information, call 333-6064, 283-4214, 283-6000 or 282-3160.

Jan. 30

NCMA classes-The National Contract Management Association and University of Houston-Clear Lake are sponsoring a course in negotiation of contracts. The classes will begin 8 a.m. Jan. 30-31 at the University of Houston-Clear Lake in the Bayou Bldg. Cost: \$100 per person. For further information contact Jean Stell at 283-3122 or 283-3120.

Feb. 2

AAS conference—The American Astronautical Society will host the Rocky Mountain annual Guidance and Control Conference Feb. 2-6 at the Keystone Lodge in Keystone Village, Colo. For information, call Alice Little at (303) 939-5147.

March 5

Space conference—The Space Foundation will co-sponsor the third annual Space: Technology, Commerce & Communications Southwest conference March 5-7 at the Nassau Bay Hilton. For more information contact Roseann Tully at 617-862-

Swap Shop ads are accepted from current and retired NASA civil service employees and on-site contractor employees. Each ad must be submitted on a separate full-sized, revised JSC Form 1452. Deadline is 5 p.m. every Friday, two weeks before the desired date of publication ads to Roundup Swap Shop, Code AP3, or deliver them to the deposit box outside Rm. 147 in Bldg. 2. No

Property
Lease: Friendswood/Forest Bend, 3-2-2, formal dining, 482-6609, ceiling fan, FPL, fenced, no pets, \$625/mo. 482-6609. Lease: room in house 20 min. from NASA toward

Houston, util. included, \$270/mo. Eric, x38420 or 484-9179. Orlando, Fla., 2-2, den, Florida room, fully furnished, on 18-hole golf course, \$49,900. 280-2523 or 333-1762. Sale: Baylor condo, 1 BR, good study atmosphere furnished, tax deductable, negot x36026 or 334-3896. Sale: Pearland lot, Dixie Hollow Subdivision, Cyprus Hollow Street, all util. x39530 or 482-5003.

Sale: League City/Brittany Bay, 3-2-2 brick, FPL, \$74,950. David, 554-5514.

Rent: West Galveston Island beach house, 3-2, CA/H, day/wk/mo. Ed Shumilak, x37686 or 326-4795.

Rent: Lake Travis cabin, private boat dock, CA/H, fully

equipped, accom. 8, wkily/dly \$325/\$80. 326-5652. Rent/Lease: Clear Lake marina condo, 2-2.5-2, three level, all appli., FPL, wet bar, \$950/mo. 326-5652.

Sale: 2-2-2, guest quarters, 1.5 acres, satellite, near Santa Fe, \$69,900. 282-2667 or (409) 925-8593. Sale: Oak Brook 4-2.5-2, new carpet, on golf course, \$98K, 480-4502. Lease: Baywind I condo, CLC, 2-2-2, 2nd floor, divided

plan, FPL, refrig., W/D connection, \$450/mo. + dep. 486-5621 or 335-2909. Lease: Sagemont, 1.5 story, 4-2-2, 2200 sq. ft., gas heat,

FPL, new paint and carpet, ceiling fans, fenced yard w/ trees, no pets, \$675 + dep. 484-4944 or 333-6806. Sale: El Dorado Trace condo, 1-1.5, 825 sq. ft., immaculate cond., upgrades, all appli., assum loan w/

approval, good equiliy. Bobble, 481-9199.
Sale: Kerrville, Tex., "Take It Easy Park," 12 x 60 mobile home, furn, good cond. 1g. carport and covered patio, \$6,000. 333-6150 or 326-1254.

Sale: Hot Spring Village, Ark., wooded lot, util. and nprovements, \$9,800, OBO. 326-1254 or 333-6150. Rent L.C. Countryside, 3-2-2, FPL, fenced, miniblinds,

\$725/mo + den 486-9811 Rent/Lease: Baywind I condo, 1 BR, avail. Jan. 1, \$395/ mo. 480-9280.

Sale: University Green townhouse, 3-2-2, fans, FPL whirlpool tub, loft, alarm sys., decked crtyd, 2 min. to JSC, \$90K Dennis, x34405 or 480-5076. Sale: Pipers Meadow, 3-2.5-2, formal LR/DR, FPL, loft,

wet bar, fans, gar. door opener, deck, landscaped, new paint, 15 min. to JSC, 10% assum., \$92K, Dennis, x34405 or 480-5076.

Rent: Galveston condo, Seawall Blvd. and 61st Street, furn., sleeps 6, dly/wknd/wkly rates, cable TV. Magdi Yassa, x33479 or 486-0788 Sale: LC 3-2-3, on 3/4 acre, very secluded w/lg. trees

and hot tub. 5 min. from NASA, x38891. Lease: Webster/Ellington, nice 2-1 apt, many extras. \$425/mo. Dave, x38156 or Herb, x38161.

Sale: Friendswood/Wedgewood Village, 3-2-2, lg. rec. rm., over 2,000 sq. ft., \$74,900. 333-7010 or482-5393.

Friendswood, Ig. lot, 120' x 162', in custom neighborhood, all util., walking distance to elem. and jr. high, \$34,000. Rick, 283-1988 or 996-8961. Rent LC, 2-1 frame, Ig. lot, hugh trees, 10 ft. ceilings

w/fans, quiet secure area, 4 mi. to JSC, \$425/mo. Gene, x38020 or 334-1505. Seabrook bayfront lot, \$125K; two water view lots near NASA, \$38.5K ea. Don, x38039 or 333-1751.

Rent: Galveston condo, modern, bright, 2-1, FPL, all ew carpet, walk to beach, clean and safe complex

Cars & Trucks

'77 Grand Prix, good cond., new trans., tires and radiator, \$1295 OBO. David, 554-5514 or 282-3827. '88 Toyota Camry LE, blue, pwr sun/moonroof, loaded.

6-yr. 75K mi. extended warr., 35K mi., \$11K. Ursula, 283-'90 Honda CRX-HF, 5-spd, AC, AM/FM/cass, white

w/sport graphics, deep tint, less than 500 mi., \$8800. Bill H., x35626 or 282-3395. Fiat 124 red convertible sports car, not running but

88 Mazda MX-6 Turbo, loaded, sunroof, low mi., warr., asking payoff, x39166 or 326-5865.

fixable, \$1500. Cliff Watts, x35477 or 534-4145

'87 Chevy Cavalier, 4-dr, auto, AC, 37K mi., ex. cond., good gas mileage, warr., \$4400 OBO. Dave, x39579 or '90 Mazda 626LX, loaded, sunroof, ex. cond., warr.,

\$1500 equity and refinance bal. Thelma, x33107 or 633-'83 Buick LeSabre, 2-dr., loaded, firnited edition, ex.

cond., \$2500. Scott, x39156 or 482-8017. '67 Camero, new hi-performance 454 B&M Turbo 400, posi-track, cowl hood, mag., new carpet, dash, needs paint. Scotty, x39570 or 470-1096. '90 Plymouth Colt GT, twin cams, 16 valves, 5-spd.,

AC, AM/FM/cass., 16K mi., like new, \$8500. Bob. x32350 76, AW/FM/Cass, 100 Hill, like HeW, \$6000. Boy, 82250 or 331-5069. '86 Chevy Camaro Sports Coupe, V-8, auto, T-tops, cruise, PW, tilt, new tires and brakes, burglar alarm, ex. cond., 26K mi., \$8000. Bernie, x32515 or 486-4722. '85 Pontiac Bonneville, 70K mi., loaded, V8, \$3900. 757-

3827 or 488-8036.

'88 Cutiass Supreme International, 2-dr., sport coupe, 2.8 multiport FI, all pwr, 34K mi., \$9200 OBO. Kirk, 282-2911 or 332-5876. '82 Buick Century Limited, 4-dr., V6, auto., loaded, 73K

ni., new tires, \$3000. Gilles, x36267 or 486-0833.

'86 St. Regis Ford Anaheim Van Conversion, 47K mi., loaded, color TV VCD capable, stereo system-head phones, captain seats, sofa bed, ex. cond. 480-8559. '81 Thunderbird, AC, PS, PB, cruise, AM/FM/cass,

\$1600. Bob. 283-4146. '85 Buick Park Avenue, ex. condo., burgundy, loaded, all electric, \$5800. David, 334-2766.

'72 Ford F-150 Fleetside PU, V8, auto., \$1400. Butch, '89 Chevy Suburban, loaded, ex. cond., approx. 22K

mi, assume note. Dale, x39441.

'89 Dodge Ram 100 PU, short wheelbase, red w/tan interior. 16K mi., V6, custom wheels and tires, may rent to own. Mike, 333-6821 or 474-3637.

'85 Cadillac Sedan DeVille, front wheel drive, loaded, low mi., \$8000. Mike, 333-6821 or 474-3637. '82 Pontiac J2000, 127K mi., \$2000 OBO. Leah Elliott,

Laredo CJ-7, 4-spd, AC, winch and more, \$5500. Jeff; x32283 or 489-9401. '75 Chevy Van SWB, AC, PB, PS, 3-spd std/overdrive, \$1500. x39382 or 486-9811.

'83 Plymouth Turismo, 2-dr. htchbk., ex. cond., 62K mi., 5-sod, \$2100 OBO, Dennis, x34405 or 480-5076 '86 Mazda 626LX, 2-dr., dark blue, pwr door lock and sunroof, auto, AM/FM/cass., one owner. 480-2264.

'79 Dodge Omni htchbk., good mechanical cond., good gas milage, \$1150. 283-4402.

'88 Pontiac Firebird, 5.0 liter, V8, auto., ex. cond., blk. w/grey interior, \$7850 OBO. Greg, 484-4979 or 929-7348. '85 Buick Regal, good tires, AM/FM/cass., \$2000.

'86 Honda Prelude, 5-spd., sunroof, AM/FM/cass., new

tires and brakes, \$600. x31237 or 488-8614.

182 Nissan Sentra, 4-dr. wagon, auto., it. blue, engine needs work, over 100K mi., \$1200 OBO. Shirley, x34179 or 482-0800

'85 Chevy station wagon, V8, AC, PS, PB, 9 passenger, \$2995, Floyd, 482-7005 '77 Dodge Royal Monaco, pwr, AC, second owner, reliable, service records, \$800 OBO. Gene, x38020 or 334-

'80 Pontiac Phoenix, V6, AC, 5-dr liftback, new auto w/1 yr warr., new batt., runs good, low mi., \$2350. x30092.

80 Kawasaki KE100, engine needs work, \$200; '79

Honda XL75 dirt bike, runs great, \$150, 488-4415. Honda MB-5 50cc motorcycle, black, ran great when put in storage 3 yrs. ago, good cond., needs minor fix, \$75. Mark, 282-3940. Bicycle, 10-sod., \$40 OBO, David, x36647 or 526-3045.

'75 Honda 550cc, runs good, 2 helmets, manual, \$425.

Boats & Planes

25HP Evinrude, elec. start, new in box, \$1700. Jerry Craig, 283-5311 or 420-2936.

13 ft. fiberglass sailing dinghy, main and jib, galv. trlr., \$600. Bob. 482-9576.

17' Hydro-Stream, 150HP Merc., galv. trlr., w/extras,

\$2900 neg. Carl Hart, x49795 or 538-1101.

'79 Renegade 1540 ski boat, 140HP Evinrude, SST prop, custom trlr., runs like new, \$2500 OBO. 333-6868 or 486-7546.

'88 Champion bass boat w/175XP Evinrude, very low hours on motor, was over \$20K, now \$12K. Dale, x39441. **Audiovisual & Computers**

Amiga 1000, color monitor, external 5.25 and 3.5 drives, 1.5 meg memory, lots of software, \$875. Bob, 482-9576. TEAC A3440 4-channel reel-to-reel, mint, used less than 20 hrs., pro quality, \$800. Mark, 282-3940. SEGA Video Game System, includes pwr base, 2 reg. control pads, 1 enhanced control pad, 1 phaser gun, 25 video game cartridges/cards, ex. cond., \$400. Lisa, x34515

Zenith laptop computer w/ext. drive, misc. software and software books. Peter, 334-2081.

MGA (Missubishi) stereo sys., with integrated amp, tuner, turntable and pair of speakers, \$350; pair of Advent Prodigy tower speakers, \$250; pair of Advent Baby II, \$175. x33572 or 996-1382.

Macintosh 512 enhanced w/800K internal disk drive,

\$500. Emmett, x37729.

Apple Ile computer, dot matrix printer, CPM board, 2 megs RAM memory, time clock, game port, parallel printer card, lots of software and games, \$600 for all. 486-1507. 13 in. color TV w/remote, cable ready, ex. cond., \$100.

534-4780. Atari 800 computer w/2 disk drives, printer interface, various games, SAT test, word processor, \$150. 335-2465 or 332-4302.

Macintosh 512 enhanced, 800K drive, used very little, Heath SW7800 general coverage shortwave receiver.

150 kHz to 30 MHz digital readout, \$150. Calvin, x33806

JVC VCR, approx. 2 yrs old, still has 1 yr. warr., \$175 OBO. Lea, 333-7306 or 554-2364. IBM XT computer, 640K memory, 30 MB hard disk, 2 floopies, color hi-res monitor, \$975; Intel 386 inboard M or Compaq, was \$895, now \$375. x30092 or 481-

Musical Instruments

new, \$900. 488-4415. Gmeinhardt flute, open hole, w/low B-flat key, sterling silver head, \$350. 335-4325 or 484-7659.

Pets & Livestock

Litino cockatiel, male, 6 mos. cage, \$80. Bob, 488-6817. Baby cockatiel birds, lovable, sweet. Linda, 484-7834. AKC chow pups, born 1 Nov., 2 blk., male, \$150 ea., 2 bm. male, \$225 ea. 332-7082.

Pure-bred Chinese shar-pei puppies, seven weeks old, male and female, shots, registered, price nego. G. Raffoul, x31467 or 937-7648

Free mixed puppies to good homes, outside dogs, born 11-19-90, avail. beginning 91. Kim, 263-5703 or 559-2764. Himalayan/Persian kittens, CFA, blue Persian (F), seal point, blue point, blk, blue, gr. champion lines, vet checked, \$250-\$350; stud service avail., reputable breeder, neutered male blue Persian, top show quality, 1½ yr old, doesn't spray, affectionate, animated, \$350, OBO. Kristy, 286-0146. Black Labrador pupoies, AKC reg., 6 wks old, blk mother and chocolate father on premises, \$200. Karen, x31385

Tiny, toy poodle pup, male, apricot, AKC reg., champion. blood line, born 10-31-90, \$300. Heather, x30582 or 332-

Pure bred Doberman puppies; born 11-7-90; tails, duclaws & 1st shots, parents on premises females \$100. Merrell, x37570 or 944-1886 Registered exotic Vietnamese pot bellied pigs. \$300-

\$2000 ea.; exotic doves and finches, \$5 ea. James, 335-AKC stud service, male chow chow, big blk long-haired, great disposition, your place or mine. Jackie, x31350 or

Pure bred male cocker, 31/2 yrs old, papers, \$50. Cheryl, 283-5860. AKC Pekingese pups, born 12-9-90, 2 males red sable w/white feet, 4 point sire. champion bloodline, \$250. Sharen, 244-9737 or 473-6754.

Photographic Pentex ME camera w/50, 135 & 35-70 zoom, \$200.

Steve, x33403.

Olympus OM-1, winder 1, shoe 1, T-32 flash, Olympus Zuiko lens, 28mm 2.8, 50mm 1.8, 75-150mm 4.0, 300mm 4.5, all lens & base covers, all cases, all books, gadget bag, \$500. 486-7554.

Nikon EM 35mm camera w/zoom lens, flash, cases,

ters, cable release, \$190. Rich, x35137.

Minolta X-700 camera, 50mm 1:1.7 lens, 80-200mm 1:4.5 macro lens, auto 280 PX flash, camera bag, ex. cond., \$250. Jay, 929-7134 or 481-2335.

Nikonos underwater camera w/35mm lens, strobe, hard case and many extras, \$425. 280-0176.

Household Wards Signature chest deep freezer, 16 cu. ft., \$150; Maytag gas dryer, \$80; Ig. double-door freezer/refrig., \$180; misc. broken gal. house paint, \$1/can. Samouce,

35053 or 482-0702. Recliner, like new, hideous green color, very comfortable, \$80. Edward, x36250.

Piano/organ bench, lift top, \$15; fabric covered arm chair, \$25, 332-7082. Lg. office desk, ex. cond., 2.5' x 5', wood veneer, 3 drawers on right side, 2 drawers (1 file drawer) on left side, \$160. 996-8357.

Lg. Kenmore refrig./freezer, side-by-side, w/ice maker, avacado, \$150. Pat, x35011 or 488-3829. G.E. side-by-side, frost-free, 22 cu. ft., refrig./freezer, 10 yrs old, white, \$400. x32010 or 554-6743.

Early American, 3-cushion sofa, good cond., w/throw-llows, \$60, OBO. x36623 or 332-8639. Computer desk, like new, \$55. Bill, x31574 or 333-

Desk, 48 x 18, good cond., 7 drawers, \$95. Ted, x36894 or 280-9595.

Unused 23K/24K gold plated flatware, 70-piece service for twelve, finest chrome nickel steel, padded storage case, was \$1200, now \$295. CLiff, x38166 or 486-8810.

Couch, earth tones, w/foldout bed, good cond., \$50. Antique green bedroom, full sz. bed, complete, \$750;

\$400; G.E. dishwasher w/pot scrubber, needs adjustment, \$75. Magdi Yassa, x33479 or 486-0788. Modern beveled-edge, rectangular glass-top dining

table w/cream-colored trestle base, ex. cond., was \$550, now \$280, OBO, Katie, x33185. King sz. solid wood cannonball headboard w/frame,

box spring & matt., \$150, 476-5711. Sectional sofa w/hide-a-bed & 2 recliners, brown, \$800. Full sz. waterbed, \$75, OBO, Lea, 333-7306 or 554-

L-shaped recliner couch, taupe color, durable valourtype fabric, \$125; computer desk and hutch w/2-doors

and 1 drawer, ex. cond., \$100. Susan, 488-9020 or 480-Two leather-sided, glass-top coffee tables, \$50; butcher block dining table w/chairs, \$75; washing machine, \$100; Amana Touchmatic II microwave, needs repair, BO.

James, 335-6710 or 482-6744.

Want TI-99/4A educational and games software cartridges for children age 5 and up. Ed, x36969 or 332-

Want roommate for house in Sageglen, lg. living area, \$270/mo, includes util. Eric. x38420 or 484-9179 Want '75 to '80 Ford Pinto automatic, no pwr, no AC, body not important, does not need to run, must be towable. Trey, 280-4275 or 484-7834. Want stainless steel meat slicer, x32845 or 554-4949.

Want frequent ride to and from Dallas on weekends. will share gas expense. Steve, x36623 or 332-8639.

Need riders for trip to Steamboat, Colo. in IFR equipped private airplane from March 1 to March 9, x38740 or

992-3827 Want '82 Datsun 200SX hardtop coupe, auto. Fred, Want roommate to share new 4-2.5-2 in South Shore

Harbour, non smoker, \$500. Sharon, 333-7223 or 334-Want roommate to share lo. 3-2-2 w/FPL, 15 min from JSC, \$250 plus 1/3 util., avail Jan 1. Rob, x35487 or

Want riders for a vanpool starting from SW side and

Braeswood-610 locations to CL/JSC. Chau, x31451.

Want nonsmoker fem roommate to share 3-2-2 w/pool & spa in Friendswood, \$325/mo. plus 1/2 util. 996-7678. Want man's scuba gear, suit, BC, regulator, etc., must be reasonable priced, 280-8796.

Miscellaneous

Tilf-out spare tire rack for RV or trlr, \$20; spare tire cover, black w/Mallard logo, \$5; 4" x 4" cribbing blocks, \$1/pr. Samouce, x35053 or 482-0702.

Wedding gown, white Queen Anne neckline, tiered lace ruffle, chapel length train, sz. 5/6., preserved, \$250. Sue, 488-4264 or 332-2849. DP AirGometer 14-3800B exercycle, ex. cond., \$200. Bonnie, 486-9751.

Assorted maternity clothes, baby items, baby and toddler clothing up to sz. 3, girl's. 332-0442.

Merlin Accu-II blood-glucose analyzer kit, included videotape, audio cassette, lancets, chem. strips, etc., new, \$100. Jackie, x31350 or 554-7305.

'81 Ski Nautique anniversary model, 450 hrs. Mary, Old Maytag antique gaosline washing machine motor,

cycle w/lg. aluminum flyhweel, kick start, make offer. cotty, x39570 or 470-1096. Beautiful peach lace over peach satin tea length formal, low back w/sash, sz. 11/12, worn in 10/90 wedding, was \$200, now \$100, OBO. Cathy, x30415.

Soloflex weight machine includes butterfly, leg extensions and weights, ex. cond. Kirk, 282-2911 or 332-Lady's ski boots used one season, sz. 8 1/2, \$50; new

Serta sunlamp on 5' stand, \$35; lady's foxtail jacket, never worn, was \$700, now \$300, lady's brown mink stole, good cond., \$100. 486-0174.

Tunturi "202" rowing machine, ex. cond., \$50. Gary, 2 windsurfers, beginner and intermediate, full set up, both \$700, OBO, will sell separately. Michelle, 280-2587. Set of 4 rims, blk. wire mesh, 5 lug, 14 in., used 1 mo., \$225. Rick, 283-1988 or 996-8961.

184 Celebrity/Citation shop manual, also '79 Olds donut spare tire w/wheel. Fred, 944-0493.

Ski trip for two at the Summit, Colo., includes round-

trip airfare, 5 nights lodging and 4-day Ski the Summit lift tickets. Feb. 27-Mar. 4. Jose, x30373 or 480-1899. Sears exercising machine, skier/rowing, like new, \$125; Galveston timeshare, \$11,500, OBO. (409) 938-3171. Anollo XIV and XV Men In Space coin set, sterling

Iver, 2 coins w/case, Danbury Mint, \$18. 486-8716. Engagement ring, 18 karat yellow gold, round diamond solitaire. .68 carats, w/6 round diamonds, .18 carats, was \$1500, now \$1200. two door legal sz. file cabir cond. was \$200, now \$100. x30874 or 333-1316.

RadoDiastar Swiss made man's gold watch, appraised \$500, sell for \$250; Justin Lizard, man's sz. 12D boots, pointed toe, good. cond., were \$205, now \$75. Pete, x33571 or 334-2963.

Tony Lama ostrich boots, El Rey coll., man's sz. 9D, ex. cond., \$250, OBO. 286-3539. Metal office credenza, blk w/formica wood grain top,

good cond., 2 hanging file drawers, bookcase shelves w/doors, \$175, OBO; Sears 10HP riding lawn mower, 30 in., deck, elec./rope start, runs, needs work, \$125, OBO.

200 25¢ U.S. postage stamps for \$47.50; 500 25¢ stamps for \$118. Jeff. 333-7010 or 482-5393. New liquor carrying case w/accesssories, \$20; new

BBQ grill w/legs, \$7; complete golf set, bag, cart, shoes, all accessories, \$210; Country Club delux swivel shower head, \$15; 2 matched pool/deck adjustable metal lounges w/vinvl strapping, \$50 ea.; new matched pair, ketchup

and mustard pump set, \$6. Sam 488-9790.
Sears Lifestyler cross country skier/rower, ex. cond., \$175. Brent, x36456 or 486-0389.

Quality rowing machine, \$75; 6HP Johnson motor, like new, \$395; toilet w/seat, \$20; modem, \$50. 332-0365. Delta Airlines ticket, leaves Houston/IAH Jan. 19, 8:05 a.m., via Salt Lake City to Boise, Idaho, returns Jan. 27. 7:10 a.m., \$200, OBO. Marianne, x33706 or 554-5818

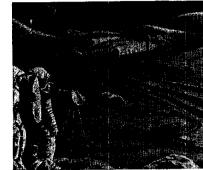
Xerox 3701 copier, needs repair, \$300, OBO. Don, x38039 or 333-1751. Small skateboard, \$15; pro type roller skates, sz. 6. ex. cond., were \$110, now BO. Aaron Brown, 944-0493. Renaissance pool table, 4' x 8', all wood, detailed, leather pockets, like new, \$875. x30389 or 286-1235.

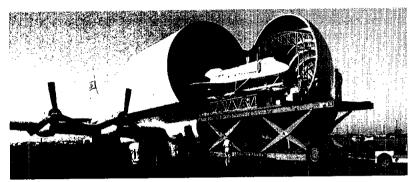
Barbell/dumbbell weight set, like new, \$15; Archery 35 lb. test, bow w/arrows & holder, \$10, 554-2267



JANUARY — Seven JSC scientists began 1990 examining the Long Duration Exposure Facility. LDEF, with 57 experiments, spent almost six years in space before the STS-32 crew retrieved it in January 1990. ▲

FEBRUARY — The Lunar and Mars Exploration Program Office was established at JSC. JSC Director Aaron Cohen implemented a significant reorganization, moving several Mission Support Directorate responsibilities to the Mission Operations and Engineering directorates, reorganized New Initiatives, and created the Information Systems Directorate. ▶



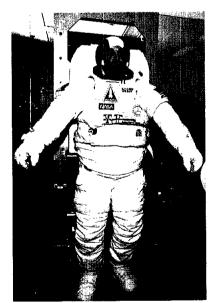


MARCH — JSC became home to a one-fourth structural scale model orbiter designed and built by Rockwell in 1974. The model now is housed in the Bldg. 49 Vibration and Acoustic Test Facility. ▲



APRIL — The JSC Child Care Center opened its doors in late April to 54 children. The 3,600 square-foot center, which took about six months to build, can accommodate 62 children. Operational funding was generated by donations and tuition. Much of the finishing work on the center was done by parents and volunteers. This year work also was completed on a new auxiliary chiller facility also known as Bldg. 28. ▲

MAY — Soviet Cosmonaut Aleksandr Alexsandrovich Serebrov dons a NASA space suit during his May visit to JSC's Bldg. 7. Serebrov said the wrist joints on the U.S. suit will turn, something the Soviet suit won't do. ▶





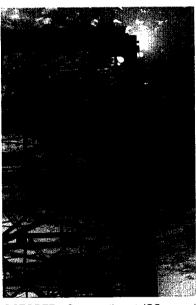
JULY — Twenty-three members of the 1990 astronaut candidate class reported to JSC to begin a year of training and evaluation. The 1990 class includes Air Force Maj. Eileen M. Collins, the first female pilot candidate, pictured here during parachute drag training. ▲







AUGUST — Several Desert Shield support groups toured JSC this fall during breaks in their work schedules. About 10 JSC civil servants are among the military personnel en route or working in support of the Desert Shield operation. ◀



OCTOBER - Construction at JSC moved into high gear as work began on expanding buildings 5, 9A and 30. This photograph shows the raising of the first truss in the Bldg. 9C construction this fall. In October, construction began on a new gymnasium and foyer for the Gilruth Center. ▲

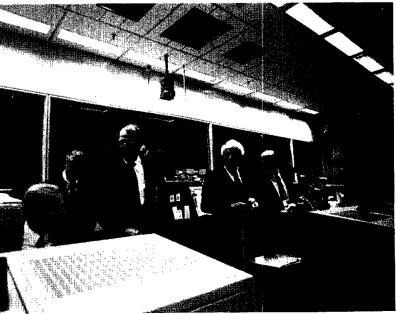
SEPTEMBER — JSC Director Aaron Cohen announced the center would provide a smoke-free environment beginning Jan. 1. ◀



NOVEMBER — A new Shuttle Carrier Aircraft stopped at Ellington Field en route from Wichita, Kan., to El Paso. The modified Boeing 747, christened NASA 911, joins its sister ship NASA 905 which has ferried all the space shuttle orbiters from California to Florida since the shuttle program's inception. ▲



JUNE — JSC Director Aaron Cohen, responding to employees' desires for more time to discuss issues with senior managers informally, began a periodic Center Director's Forum. The forum resulted from needs identified in the 1989 JSC Culture Survey. ▲



DECEMBER — U.S. Secretary of State James Baker and then Foreign Minister of the Soviet Union Eduard Shevardnadze, were in Houston for a week of diplomatic talks, toured the Space Station Freedom and space shuttle mockups, and Mission Control Center. While in the MCC, both diplomats talked with the STS-35 crew. Shevardnadze since has resigned his post. ◀

Hartman directs **Human Resources**

Harvey L. Hartman has been been assigned named acting director of Human as chief of the Resources at JSC, overseeing the center personnel program and a staff of about 60 employees.

He takes over for Jack Lister, who retired Nov. 30 after 22 years as the center's senior human resources executive.

Hartman, who joined JSC in 1966. had been deputy director of Human Resources since 1976, and director of Human Resources Development since 1985. Prior to that, he had been chief of the Personnel Management Branch and a group leader in the personnel operations area.

He has been chairman of JSC's Exchange Council since 1984 and is a member of the board of directors of the Manned Space Flight Education Foundation Inc., the non-profit organization that is developing Space Center Houston, the new JSC visitor center.

Hammersley new chief of Technical Services

Vernon C. Hammersley Jr. has NASA extends

Flight Equipment

NASA has extended its Flight Equipment Processing Contract with Boeing Aerospace Operations through Nov. 30, 1993. The value of the three-year extension is \$103.4 million, increasing the current contract value to \$210.3

Processing Contract

Boeing was first awarded the contract in December 1985. The cost-plusaward-fee contract also includes options that would extend the performance period to Nov. 30, 2000. The potential total value of the contract is \$492.1 million.

The contract covers processing and preparation of astronaut flight equipment for space shuttle missions and astronaut crew training, including the management, operation, testing and modification of specific equipment. Most of the work on the contract is performed at Boeing's Houston facility.

Picnic meeting set

The JSC Picnic Committee will kick off planning for its 1991 event from 4:30-6 p.m. Tuesday in the Gilruth Center, Rm. 204.

Anyone who is interested in serving on the committee is encouraged to attend the meeting or call Ginger Gibson at x33216 or Melody Goss Technical Services Division in JSC's Center

Operations Directorate, effective Jan. 13.

Hammersley, who had been deputy chief of the Automation and Robotics Division in the Engineering Directorate, replaces J.D. Williams, who retired in November.

He has been chief of the Mockup and Trainer Section and of the Facilities Operations Branch in the Space and Life Sciences Directorate.

GNC/IPS team earns plaque hanging honors

The Guidance, Navigation and Control/Instrument Pointing System team recently earned the honor of hanging the STS-35 plaque in the Mission Control Center.

Flight Director Al Pennington said Team Leader Ken Bain was asked to hang the plaque, but that he passed the honor to Will Fenner because Bain's left arm was in a cast.



thing," Pennington said.

Hammersley









McDaniel



Parnell

"The whole team was honored for Lulla prepares astronaut briefings its outstanding performance in comand training on Earth observations ing up with a way to command the and remote sensing. IPS to operate from the ground when we didn't have plan to do such a

The award, which recognized his professional accomplishments in science and space technology, is given annually by the ICC, an umbrella organization for American citizens of South Asian origin.

Trio receives top secretarial honor

Marilyn Davison, Merrell McDaniel and Judy Parnell recently received the Marilyn J. Bockting Award for Secretarial Excellence.

Davison provides secretarial support to the manager of the Technology and Commercial Projects Office in the New Initiatives Office. She was cited for creating the administrative procedures for the office, established in 1988, and for improving the

effectiveness and efficiency of the office's many work elements.

McDaniel is secretary to the Information Resources Management Services Office in the Information Systems Directorate. She was cited for her ability to adapt to the newly formed directorate's structure, and for supporting two office chiefs for several months pending the physical relocation of personnel.

Parnell is secretary to the deputy manager of the Space Shuttle Program. She was recognized for her knowledge of the Space Shuttle Program, its major milestones and the matters of importance associated with meeting those milestones, and for efficiency in dealing with complex calendar and travel scheduling and arrangements.

Each secretary was presented with a plaque, and will receive a \$500 stipend.

Both Bain and Fenner are Rock-

Space Operations Co. employees.

Lulla gets award from Indian center

Kam Lulla of JSC's Flight Science Support Office recently received the 1990 India Culture Center's Outstanding Professional Award.

Two cost-cutters earn large awards

JSC Director Aaron Cohen pres- to Tissue Assembly Process and a ented two large awards in December for suggestions that reduced some costly shuttle software verification and kept the Bldg. 1 ceiling from being replaced.

Scott A. Seyle received a \$3,465 award for an "OPS 4" system management plan that omits the need to verify a piece of shuttle computer programming when that software is inhibited for a specific flight.

Gary D. Wessels received a \$4,400 award for pointing out that workers could install a sprinkler system above Bldg. 1's first floor ceiling without replacing the ceiling. Wessels located a scaffolding system that gave workers the needed access between the ceiling and second floor.

Cohen also presented Patent and Tech Brief Awards to seven JSC workers, and gave four others Antarctica Service Medals.

Two Patent Awards went to David A. Wolf for a Three Dimensional Cell Three Dimensional Co-Culture

Tech Brief Award went to Wolf for Biologically Active Factors Produced by Multicellular Co-cultivation, High Aspect Culture Vessel and Three Dimensional Co-Culture Process, Glen F. Steele for a CCSDS Audio Signal Processor, Christopher W. Brown, for a Two Fault Tolerant Toggle-Hook Release, Leslie J. Quiocho for Dynamic Modeling of 6N Degree-of-Freedom Robotic Manipulator Systems, Mark E. Rorvig for a General Machine Image Pattern Classifier, Richard L. Sauer for a Biocide Source/Sink for Microbial Control of Stored Potable Water, and Harold Reimers for a Universal Quick

of the Navy/National Science Foundation Antarctic Service Medal to James E. Ratliff, Patrick M. O'Neil, Pedro A. Martinez and Rafael E. Munoz.

Society plans trip to view eclipse

organizing a trip to observe a total eclipse of the Sun in Mexico July 9-

The eclipse will be the longest for the rest of the century when the Moon passes in front of the Sun shortly after noon on July 11, blocking its light for nearly seven minutes.

Amateur astronomers from eight

The JSC Astronomical Society is states and three foreign countries already have signed up for the trip. Participants will spend three nights in Puerto Vallarta and travel by bus to the city of Tepic on eclipse day. JSC employees and their families who would like to make the trip should contact Paul Maley at x34636 or 488-6871 as soon as possible. Space is limited.

Ethics reforms in effect

(Continued from Page 1) conflict of interest, Flagg said.

most employees, Flagg said.

For most employees, the impact of the amendments to post-employment restrictions probably will be negligible. While there are some new restrictions, they are aimed largely at senior government officials and will not affect

The added post-employment restrictions provide for a one year cooling-off period for "very senior" employees such as those at the cabinet level and a one year coolingoff period from advising or representing foreign governments for senior and very senior employees.

of certain procurement integrity quidelines has been lifted and some new guidelines added. The new guidelines spell out procedures for recusal or withdrawal from involvement with a particular procurement; provide clarification of postemployment restrictions regarding sub-contracts; and provide procedures for both former and current employees contacting an angency ethics official and requesting ethics advice.

Also as of Dec. 1, the suspension

For additional details regarding ethics rules, employees should call the JSC Legal Office at x33021.

Smoker's Diary reprints available

(Continued from Page 1)

The class, very successful in its first session, is taught by Dr. Larry Laufman of the Institute for Preventive Medicine at Methodist Hospital. JSC covers all costs, except for a \$50 registration fee that is refunded if the participant attends seven of the eight classes. For details,

Space News Roundup is offering reprints of the eight-part "Smoker's Diary" series, which chronicled Brian Welch's participation in the class. To receive a copy, stop by Bldg. 2, Rm. 147, or send a self-addressed inter-

call Beth Hall at x33078.

Disconnect Attachment Mechanism. Cohen presented the Department

Work resumes on processing shuttle fleet

(Continued from Page 1)

of three such units that pressurize and power the shuttle's hydraulics, was installed, and new carbon brakes were put in to replace Atlantis' original beryllium brakes.

STS-37 is under way in high bay 3 rolled out of OPF Bay 1 late this in early May.

of the VAB.

Meanwhile, Columbia is stored in high bay 2 of the VAB, awaiting a to the current fleet when Endeavour spot to open up in the processing is delivered this year. Work on facility. Purges of residual fuels are Endeavour at Rockwell's Palmdale, Work on the SRBs for Atlantis and remain in the VAB until Discovery is delivery of the new orbiter to KSC

FLYING LOW-A crowd of employees stands outside JSC

buildings as Columbia flies overhead, perched atop its Shuttle

Carrier Aircraft. The fly over at about 2,000 feet occurred as

Columbia was returning to Kennedy Space Center on Dec. 19.

NASA will add a fourth spacecraft under way on Columbia, and it will Calif., plant is on schedule for a

JSC Photo by Kim Murray

Space station design matures, converges

(Continued from Page 1)

were 143,000 pounds higher than the allocated limit of 512,000 pounds for the total space station, and housekeeping power exceeded the maximum 45 kilowatts available by nearly 15 kW. An intensive summer-long resources scrub reduced weight estimates by 130,000 pounds and reduced the housekeeping power by 13 kW. Users will receive 30 kW of power to conduct their experiments.

Despite the added rigors of the ISPDR review progress, weight and power levels have remained stable.

'What this means is that the design is maturing and converging," said Bensimon. "While a PDR is typically conducted with the hardware only 10 percent designed, I was impressed with the detail of the preliminary design and the knowledge our systems managers displayed with

respect to expected performance of their systems.'

While hardware was a major focus of the ISPDR, space station managers also reviewed and baselined ground processing procedures, computer software specifications and pre-flight verification plans for Freedom.

They also approved design modifications such as those suggested by JSC's Dr. William F. Fisher and Charles R. Price, co-chairs of the External Maintenance Task Team. In the EVA systems area, program managers approved a change that would provide a handle on all external orbital replacement units so that those components could be replaced by robots as well as humans.

Both Moorehead and Bensimon acknowledge the current restructure assessment (begun in November as a result of a 1991 fiscal year budget of our restructure assessment."

shortfall of more than \$550 million along with a Congressional mandate to significantly reduce out-year spending) will have an impact on the design but are confident that the ISPDR has laid a firm foundation for the restucturing.

'Certainly there will be design changes," said Moorehead, "but I think that from a systems and subsystems standpoint, the ISPDR configuration provides us with an excellent baseline to work from for the restructuring. After all, regardless of what Freedom will look like from an overall configuration standpoint, we will still have to have systems like power, thermal control, data management and guidance and control. I anticipate being able to use a significant proportion of those systems in the station that comes out

> office envelope to Smoker's Diary, AP3. NASA-JSC